

What is claimed is:

1. A method of fabricating a pixel electrode in a liquid crystal display including a switching device for driving the pixel electrode, the method comprising:

depositing a protective film over a substrate to cover the switching device;

defining a contact hole in the protective film to expose one electrode of the switching device; and

forming the pixel electrode connected, via the contact hole, to said one exposed electrode, wherein the pixel electrode is formed by placing the substrate in a vacuum chamber and injecting Hydrogen-containing gas at a temperature of less than about 400 °C.

2. The method as claimed in claim 1, wherein the pixel electrode has an amorphous structure.

3. The method as claimed in claim 1, wherein the pixel electrode is etched with a weak acid etchant.

4. The method as claimed in claim 1, wherein the substrate has a temperature of less than about 200 °C when forming the pixel electrode.

5. The method as claimed in claim 1, wherein the substrate has a temperature between about 50 °C and about 150 °C when forming the pixel electrode.

6. The method as claimed in claim 1, further comprising the steps of:

forming a gate electrode over the substrate;

entirely depositing a gate insulating film over the substrate to cover the gate electrode; and

continuously depositing an active layer and an ohmic contact layer to overlap the gate electrode.

7. The method as claimed in claim 1, wherein the protective layer is a passivation layer.

8. The method as claimed in claim 7, wherein the passivation layer is made from an inorganic insulation material or an organic insulation material.

9. The method as claimed in claim 7, wherein the passivation layer is at least one material selected from the group consisting of silicon nitride, silicon oxide, an acrylic, polytetrafluoroethylene, benzocyclobutene, fluoropolymer resin and perfluorocyclobutane.

10. The method as claimed in claim 1, wherein the pixel electrode comprises a transparent conductive material.

11. The method as claimed in claim 1, wherein the pixel electrode comprises at least one material selected from the group consisting of indium tin oxide, tin oxide and indium zinc oxide.

12. The method as claimed in claim 1, wherein the switching device has source and drain electrodes, and the source and drain electrodes comprise at least one material selected from the group consisting of Mo, Cr, Ti, Ta, MoW, MoTa and MoNb.

13. A pixel electrode in a liquid crystal display, which comprises:

- a substrate;
- a switching device over the substrate;
- a protective film over a substrate covering the switching device; and

a contact hole in the protective film, the contact hole exposing one electrode of the switching device, the pixel electrode being connected, via the contact hole, to said one exposed electrode, wherein the pixel electrode is formed by placing the substrate in a vacuum chamber and injecting Hydrogen-containing gas at a temperature of less than about 400 °C.

14. The pixel electrode as claimed in claim 13, wherein the pixel electrode has an amorphous structure.

15. The pixel electrode as claimed in claim 13, which further comprises:

- a gate electrode over the substrate;
- a gate insulating film over the substrate covering the gate electrode; and
- an active layer and an ohmic contact layer overlapping the gate electrode.

16. The pixel electrode as claimed in claim 13, wherein the protective layer is an organic or inorganic passivation layer formed from at least one material selected from the group consisting of silicon nitride, silicon oxide, an acrylic, polytetrafluoroethylene, benzocyclobutene, fluoropolymer resin and perfluorocyclobutane.

17. The pixel electrode as claimed in claim 13, wherein the pixel electrode comprises a transparent conductive material selected from the group consisting of indium tin oxide, tin oxide and indium zinc oxide.

18. The pixel electrode as claimed in claim 13, wherein the switching device has source and drain electrodes, and the source and drain electrodes comprise at least one material selected from the group consisting of Mo, Cr, Ti, Ta, MoW, MoTa and MoNb.